

URS-B Series

PRECISION ROTATION STAGES



- Backlash-free continuous rotation with 20,000 MTBF
- 8,000 cts/rev rotary encoder on some DC motor versions enables 0.0005° resolution
- Unique, compact 2-piece bearing design provides exceptional wobble and eccentricity
- Economic stepper motor versions with high motion sensitivity

Stage Compatibilities

Stage	URS75B	URS100B	URS150B
VP	Yes	No	No
XMS	Yes	Yes	No
GTS	No	Yes	No
ILS	No	Yes	No
IMS	No	Yes	Yes

The URS-B Series provides precision 360° continuous motion in a low profile package. They meet the requirements of numerous research and industrial applications and some are directly compatible with Newport's VP (URS75B), XM, GTS, ILS (URS100B), IMS (URS100B and URS150B) and other series of linear stages. URS-B rotation stages are available in two versions:

- The URS75BCC to URS150BCC DC-motor versions features an ultra-high resolution 8,000 cts/rev rotary encoder with index pulse for precision homing and is the recommended choice for applications requiring accurate bi-directional positioning. For the tightest position control, the rotary encoder is mounted directly on the worm screw. This eliminates most of the possible error sources associated with indirect read feedback devices. The high-torque of some DC motor versions provides the highest dynamic speed range and allows for rotating speeds up to 80 °/s. The URS50BCC DC-version is our smallest version and its motor encoder feature provides a very compact and easy to integrate version which can go up to 20 °/s with 100 N maximum load capacity.
- The stepper motor version is a more economical version for less demanding applications. When used with motion controllers with high micro-step capability, like the XPS or ESP301, low noise operation and very small incremental motions are guaranteed. The stepper motor versions do not use encoder feedback, but reach a position by the number of commanded steps and micro-steps. For this purpose, the stepper motor is directly attached to the worm screw using a proprietary bellows coupling that has a high torsional stiffness, eliminating the need for a gear or belt drive. The high output torque of the stepper motor minimizes the risk of lost steps and provides good linearity between commanded micro-steps and the actual motion of the stage.

Furthermore, except for the URS50B stages, all other versions feature adjustable limit switches to prevent over travel.

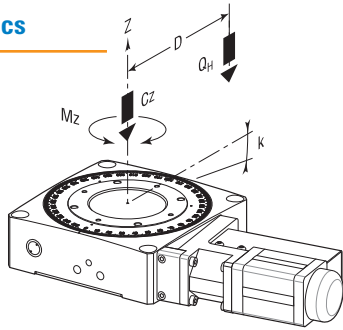
All URS-B rotation stages feature a proprietary ball bearing to provides a low-profile compact stage with exceptional stiffness, high reliability and outstanding wobble and eccentricity. The tilted worm screw arrangement allows for 4 symmetric mounting holes as compared to other designs that only feature 2 or 3 mounting holes. This enables the URS-B stages to provide better support of higher or off-centered loads. Additionally, the flexible preloading system for the worm gear was improved to guarantee a backlash-free operation with an MTBF of 20,000 hours.

Design Details

Base Material	Hardened steel body
Bearings	Large diameter ball bearings
Drive Mechanism	URS50BCC: Gearbox 1:14, no belt. URS75B to URS150B: Ground worm gear with self-compensating preload. Additional 1:2.75 drive belt with URS75BCC to URS150BCC versions (no belt on URS-BPP versions)
Worm Gear Ratio	URS50B: 1:80 URS75B to URS150B: 1:90
Feedback	URS50BCC: Encoder at motor rear, no index pulse URS75BCC to URS150BCC: Worm mounted 8,000 cts/rev encoder, index pulse URS-BPP: None
Limit Switches	Two independently adjustable optical limit switches (Except URS50B)
Origin	Optical, fixed at position 0°. Typical repeatability: 0.05° for URS50BCC, 0.0005° for URS75BCC and URS150BCC and 0.04° repeatability for URS-BPP
Manual Adjustment	Via allen wrench at the end of the worm screw. Allen wrench is included.
Motor	URS50BCC: UE18CC DC servo motor URS75BCC to URS150BCC: UE34CC DC servo motor URS50BPP: UE28PP Two phase stepper motor, 1 full step = 0.0225° URS75BPP to URS150BPP: UE34PP Two phase stepper motor, 1 full step = 0.02°
Cable	3 m long cable included

URS-B Series

Load Characteristics



	URS50B	URS75B	URS100B	URS150B
Cz, Normal centered load capacity (N)	100	200	300	300
a, Construction parameter (mm)	20	25	35	55
κ_x , Transversal compliance ($\mu\text{rad}/\text{Nm}$)	100	30	10	5
Mz, Nominal Torque (Nm)	0.25	0.5	1	2
Q, Off-center load	$Q \leq Cz / (1 + D/a)$			
D, Cantilever distance in mm				

Ordering Information

Model	Description
URS50BCC	Precision rotation stage, DC motor
URS50BPP	Precision rotation stage, stepper motor
URS75BCC	Precision rotation stage, DC motor
URS75BPP	Precision rotation stage, stepper motor
URS75BPPV6	URS75B rotation stage, stepper motor, vacuum version
URS100BCC	Precision rotation stage, DC motor
URS100BPP	Precision rotation stage, stepper motor
URS150BCC	Precision rotation stage, DC motor
URS150BPP	Precision rotation stage, stepper motor
URSBK	90° mounting bracket URS-B Series rotation stages
URS75P1	Optics Holder, 1 inch diameter, for URS75B stages
URS75TP	Solid top mounting plate for URS75B stages, 1/4"-20 threaded holes
M-URS75TP	Solid top mounting plate for URS75B stages, M6 threaded holes
URS100TP	Solid top mounting plate for URS100B stages, 1/4"-20 threaded holes
M-URS100TP	Solid top mounting plate for URS100B stages, M6 threaded holes
URS150TP	Solid top mounting plate, for URS150B stages, 1/4"-20 threaded holes

Specifications

	URS50BPP	URS75BPP to URS150BPP	URS50BCC	URS75BCC to URS150BCC
	Guaranteed	Typical	Guaranteed	Guaranteed
Travel Range (°)			360 continuous ⁽¹⁾	
Resolution (°)	0.00022	0.0002 ⁽²⁾	0.00016	0.0005
Minimum Incremental Motion (°)	0.0005	0.0002	0.001	0.002
Uni-directional Repeatability (°)	0.002	0.001	0.01	0.001
Reversal Value (Hysteresis) (°)	0.004	0.006	0.01	0.002
Absolute Accuracy (°)	0.050	0.016	0.03	0.012
Maximum Speed (°/s)	40	40	20	80
Wobble (rad)	50	20	50	20
Eccentricity (m)	6		3	6
MTBF	20000 h at 25% load and with a 30% duty cycle			

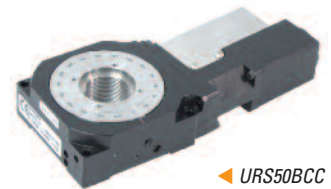
¹⁾ With disabled limit switches ($\pm 160^\circ$ with activated limit switches).

²⁾ Equal to 1/100 of a full step.

See the Motion Control Metrology Primer section in the Newport Resource catalog for more information on typical and guaranteed specifications.

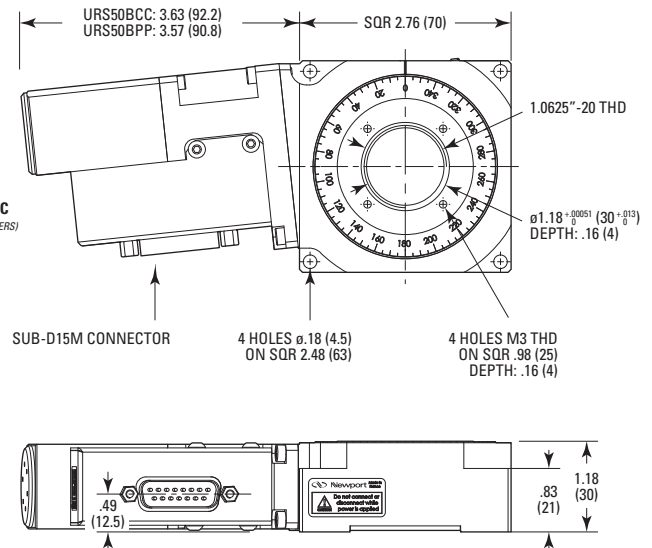
Recommended Motion Controllers/Drivers

XPS
ESP301
SMC100PP and SMC100PP

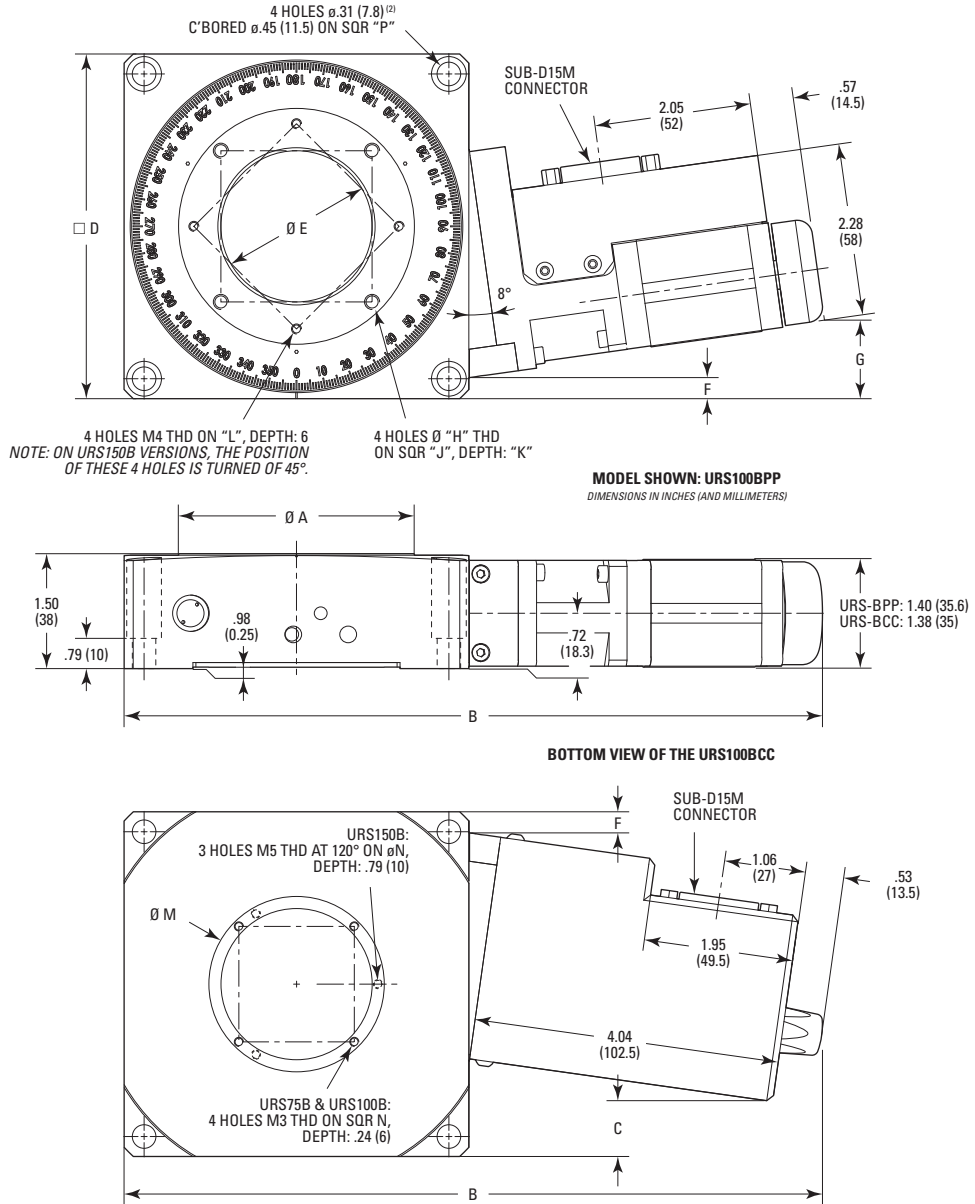


Dimensions – URS50B

MODEL SHOWN: URS50BCC
DIMENSIONS IN INCHES (AND MILLIMETERS)



Dimensions – URS75B to URS150B

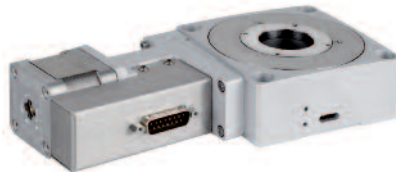


	A	B	C	D	E	F	G	H	J	K	L	M	N	P
URS75B	1.97 (50)	8.19 (208)	-.20 ⁽¹⁾ (-5) ⁽¹⁾	3.54 (90)	1.18 ^{+0.0051} (30 ^{+0.13})	.08 (2)	.83 (21)	M3	1.26 (32)	.24 (6)	-	1.50 (38)	1.34 (34)	2.98 (75.6)
URS100B	3.07 (78)	9.13 (232)	.71 (18)	4.49 (114)	1.97 ^{+0.0063} (50 ^{+0.16})	.26 (6.5)	1.02 (26)	M6	1.97 (50)	.24 (6)	SQR 1.89 (SQR 48)	2.28 (58)	2.13 (54)	3.97 (100.8)
URS150B	5.18 (131.5)	11.14 (283)	2.56 (65)	6.50 (165)	3.54 ^{+0.0087} (90 ^{+0.22})	.41 (10.5)	1.14 (29)	M6	2.95 (75)	.31 (8)	ϕ 4.92 (Ø 125)	4.13 (105)	3.86 (98)	5.91 AND 6 ⁽²⁾ (150 AND 152.4) ⁽²⁾

NOTES:

⁽¹⁾ THE DRIVE BOX OF THE URS75BCC EXCEEDS .20 IN. (5 MM) FROM THE BODY.

⁽²⁾ URS150B: 4 SLOTS COUNTERBORED.



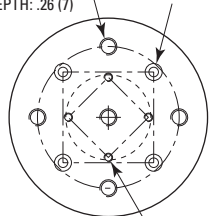
◀ URS75BPPV6 version, vacuum compatible up to 10⁻⁶ hPa

Dimensions – Bases and Bracket

(M-)URS75TP

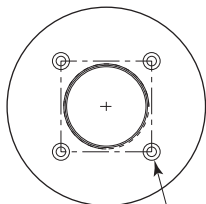
5 HOLES 1/4-20 (M6) THD ON $\phi 1.97$ (50), USABLE DEPTH: .26 (7)

4 HOLES C'BORED FOR M3 SCREW ON SQR1.26 (32)

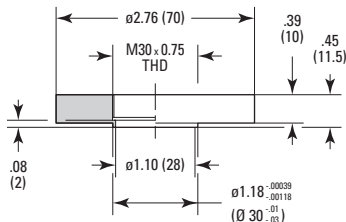
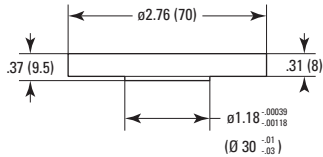


4 HOLES M3 THD ON SQR .79 (20), USABLE DEPTH: .20 (5)

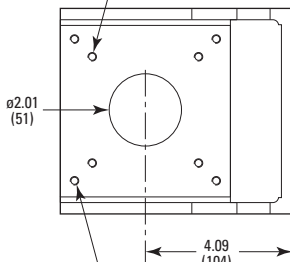
URS75P1



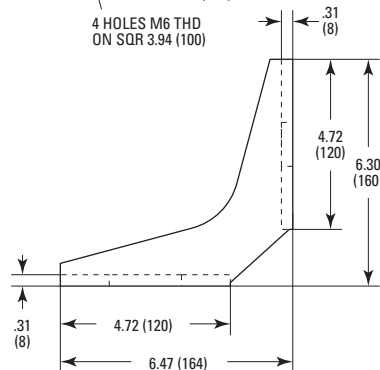
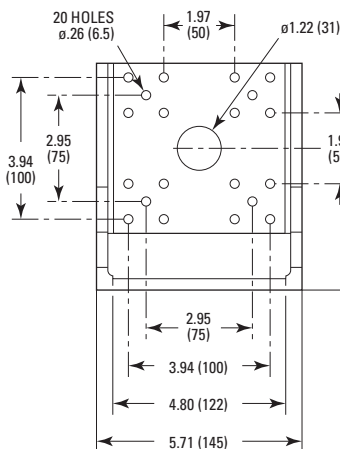
4 HOLES C'BORED FOR M3 SCREW ON SQR1.26 (32)



4 HOLES M6 THD ON SQR 2.95 (75)

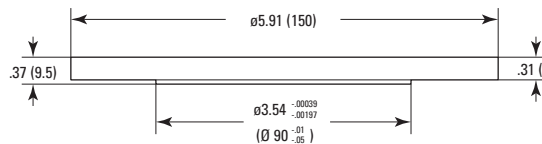
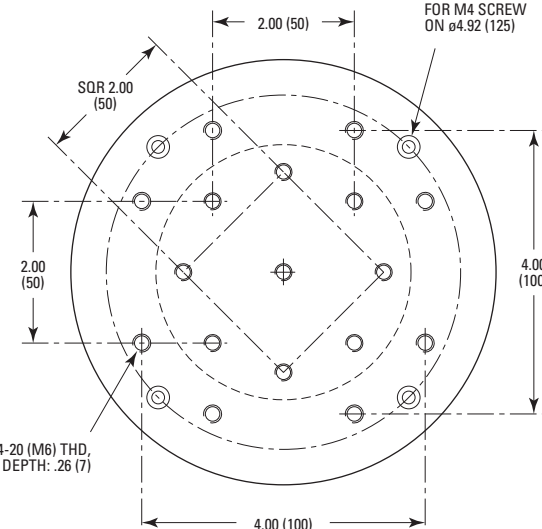


URSBK



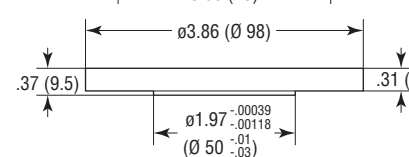
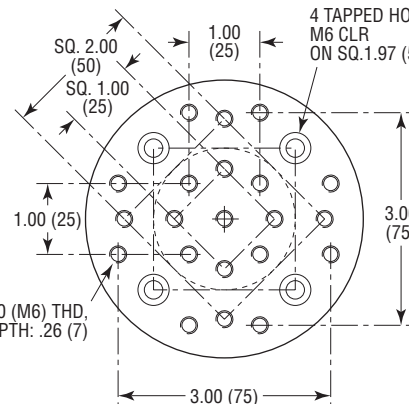
(M-)URS150TP

4 HOLES C'BORED FOR M4 SCREW ON $\phi 4.92$ (125)



(M-)JURS150TP

4 TAPPED HOLES M6 CLR ON SQ.1.97 (50)



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